

CLAIMS

WHAT IS CLAIMED IS:

1 1. A method for initiating provisioning procedures for terminals operable
2 in a mobile communications network, comprising:
3 automatically detecting an unprovisioned terminal in the mobile
4 communications network; and
5 providing a notification to a provisioning server to initiate the
6 provisioning procedures for the unprovisioned terminal in response to the automatic
7 detection of the unprovisioned terminal.

1 2. The method of Claim 1, further comprising monitoring for a subscriber
2 identifier identifying a particular subscriber and an equipment identifier identifying
3 the unprovisioned terminal, and wherein automatically detecting an unprovisioned
4 terminal comprises determining that the subscriber and equipment identifiers do not
5 collectively correspond to known subscriber and equipment affiliations.

1 3. The method of Claim 1, wherein automatically detecting an
2 unprovisioned terminal in the mobile communications network comprises:
3 receiving a subscriber identifier identifying a particular subscriber and
4 an equipment identifier identifying the unprovisioned terminal; and
5 comparing the subscriber identifier and the equipment identifier as an
6 affiliated identifier pair to stored identifier pairs comprising known subscriber-
7 equipment affiliations.

1 4. The method of Claim 3, further comprising storing the stored identifier
2 pairs in a Home Location Register (HLR) at the network.

1 5. The method of Claim 4, wherein comparing the affiliated identifier pair
2 to the stored identifier pairs comprises comparing the affiliated identifier pair to the
3 stored identifier pairs at a Mobile Switching Center (MSC).

1 6. The method of Claim 4, wherein comparing the affiliated identifier pair
2 to the stored identifier pairs comprises comparing the affiliated identifier pair to the
3 stored identifier pairs at a Serving GPRS Support Node (SGSN).

1 7. The method of Claim 3, wherein each of the known subscriber-
2 equipment affiliations comprise at least one equipment identifier for each subscriber
3 corresponding to a subscriber identifier.

1 8. The method of Claim 3, wherein receiving a subscriber identifier and
2 an equipment identifier comprises receiving at least an International Mobile
3 Subscriber Identity (IMSI) and an International Mobile Equipment Identity (IMEI).

1 9. The method of Claim 8, wherein comparing the affiliated identifier pair
2 to stored identifier pairs comprises comparing the affiliated identifier pair comprising
3 the IMSI and the IMEI to a plurality of stored IMSI/IMEI pairs.

1 10. The method of Claim 3, further comprising availing the subscriber
2 identifier and the equipment identifier to the mobile communications network in
3 connection with an attach procedure.

1 11. The method of Claim 3, further comprising availing the subscriber
2 identifier and the equipment identifier to the mobile communications network in
3 connection with a location update procedure.

1 12. The method of Claim 3, wherein automatically detecting further
2 comprises recognizing that the affiliated identifier pair does not match any of the
3 stored identifier pairs in response to the comparison.

1 13. The method of Claim 12, wherein providing a notification to a
2 provisioning server comprises notifying the provisioning server in response to a
3 recognition that the affiliated identifier pair does not match any of the stored
4 identifier pairs.

1 14. The method of Claim 3, further comprising providing the subscriber
2 identifier and the equipment identifier by the unprovisioned terminal upon power up
3 of the unprovisioned terminal.

1 15. The method of Claim 3, wherein:
2 receiving the subscriber identifier and the equipment identifier
3 comprises continuously monitoring the affiliated identifier pair at the provisioning
4 server through a signaling channel;
5 comparing the subscriber identifier and the equipment identifier
6 comprises comparing the affiliated identifier pair to stored identifier pairs at the
7 provisioning terminal; and
8 providing a notification to the provisioning server comprises providing
9 the notification internally at the provisioning server.

1 16. The method of Claim 1, wherein providing a notification comprises
2 automatically transmitting the notification to the provisioning server through the
3 mobile communications network upon detection of the unprovisioned terminal.

1 17. The method of Claim 16, further comprising creating a notification
2 message to provide the notification, wherein the notification message includes at
3 least a subscriber identifier identifying a particular subscriber and an equipment
4 identifier identifying the unprovisioned terminal.

1 18. The method of Claim 17, wherein creating the notification message
2 comprises creating a Short Messaging Service (SMS) message including the
3 subscriber and equipment identifiers in a user data field.

1 19. The method of Claim 17, wherein the subscriber identifier comprises at
2 least an International Mobile Subscriber Identity (IMSI).

1 20. The method of Claim 19, wherein the subscriber identifier further
2 comprises a Mobile Station ISDN/PSTN Number (MSISDN).

1 21. The method of Claim 17, wherein the equipment identifier comprises
2 an International Mobile Equipment Identity (IMEI).

1 22. The method of Claim 17, further comprising:
2 generating provisioning data at the provisioning server, wherein
3 generating the provisioning data comprises correlating the equipment identifier with
4 corresponding predetermined provisioning data; and
5 transmitting the predetermined provisioning data from the provisioning
6 server to the unprovisioned terminal.

1 23. The method of Claim 16, wherein automatically transmitting the
2 notification to the provisioning server through the mobile communications network
3 comprises:

4 initiating an alarm at a network management system (NMS);
5 forwarding the notification to the NMS; and
6 transmitting the notification from the NMS to the provisioning server.

1 24. The method of Claim 1, further comprising generating provisioning
2 data by the provisioning server, and transmitting the provisioning data from the
3 provisioning server to the unprovisioned terminal.

1 25. The method of Claim 24, further comprising receiving an equipment
2 identifier identifying the unprovisioned terminal and correlating the equipment
3 identifier to a matching terminal type; and wherein generating the provisioning data
4 comprises retrieving default provisioning data corresponding to the matching
5 terminal type.

1 26. The method of Claim 24, further comprising contacting the
2 unprovisioned terminal using a Wireless Application Protocol (WAP) push message
3 to notify the unprovisioned terminal of the transmission of the provisioning data.

1 27. The method of Claim 26, further comprising establishing a connection
2 between the unprovisioned terminal and the provisioning server, and wherein
3 transmitting the provisioning data comprises transmitting the provisioning data via a
4 SyncML-based protocol.

1 28. A provisioning system for automatically provisioning terminals in a
2 mobile communications network, comprising:
3 a detection module coupled to the mobile communications network to
4 monitor for at least a subscriber identifier and an equipment identifier transmitted
5 from an unprovisioned terminal;
6 a provisioning trigger module coupled to the detection module to
7 generate a provisioning notification based on the subscriber and equipment
8 identifiers indicating that the unprovisioned terminal has been introduced on the
9 mobile communications network; and
10 a provisioning server coupled to receive the provisioning notification
11 and to instigate provisioning procedures with the unprovisioned terminal in response
12 to the provisioning notification.

1 29. The provisioning system as in Claim 28, wherein the detection module
2 is integrated with an existing network element of the mobile communications
3 system.

1 30. The provisioning system as in Claim 28, further comprising a Mobile
2 Switching Center (MSC) coupled to receive the subscriber identifier and the
3 equipment identifier, and wherein the detection module is integrated with the MSC to
4 monitor for the unprovisioned terminal.

1 31. The provisioning system as in Claim 30, wherein the detection module
2 comprises a processor integral to the MSC, and wherein the processor compares an
3 identifier group comprising the subscriber and equipment identifiers to known
4 subscriber-equipment groups.

1 32. The provisioning system as in Claim 31, further comprising a database
2 to store the known subscriber-equipment groups.

1 33. The provisioning system as in Claim 32, wherein the database
2 comprises a Home Location Register (HLR) operable in the mobile communications
3 system, wherein each record of the HLR comprises:

4 a subscriber identity field to store the subscriber identifier; and
5 an equipment identify field to store the equipment identifier.

1 34. The provisioning system as in Claim 30, wherein the provisioning
2 trigger module is integrated with the MSC to generate the provisioning notification.

1 35. The provisioning system as in Claim 34, further comprising a Short
2 Message Service Center (SMSC) to receive the provisioning notification from the
3 MSC, and to transmit the provisioning notification to the provisioning server, wherein
4 the provisioning notification is dispatched as a Short Messaging Service (SMS)
5 message including at least the subscriber identifier and the equipment identifier.

1 36. The provisioning system as in Claim 34, wherein the provisioning
2 trigger module comprises a processor integral to the MSC, and wherein the
3 processor generates the provisioning notification in response to the detection of the
4 unprovisioned terminal.

1 37. The provisioning system as in Claim 34, further comprising a Network
2 Management System (NMS) to receive the provisioning notification from the MSC as
3 an NMS alarm signal, and to transmit the provisioning notification to the provisioning
4 server in response thereto.

1 38. The provisioning system as in Claim 28, further comprising an Serving
2 GPRS Support Node (SGSN) coupled to receive the subscriber identifier and the
3 equipment identifier, and wherein the detection module is integrated with the SGSN
4 to monitor for the unprovisioned terminal.

1 39. The provisioning system as in Claim 38, wherein the detection module
2 comprises a processor integral to the SGSN, and wherein the processor compares
3 an identifier group comprising the subscriber and equipment identifiers to known
4 subscriber-equipment groups.

1 40. The provisioning system as in Claim 39, further comprising a Home
2 Location Register (HLR) database operable in the mobile communications system to
3 store the known subscriber-equipment groups, wherein each record of the HLR
4 comprises:

5 a subscriber identity field to store the subscriber identifier; and
6 an equipment identify field to store the equipment identifier.

1 41. The provisioning system as in Claim 38, wherein the provisioning
2 trigger module is integrated with the SGSN to generate the provisioning notification.

1 42. The provisioning system as in Claim 41, further comprising a Short
2 Message Service Center (SMSC) to receive the provisioning notification from the
3 SGSN, and to transmit the provisioning notification to the provisioning server,
4 wherein the provisioning notification is dispatched as a Short Messaging Service
5 (SMS) message including at least the subscriber identifier and the equipment
6 identifier.

1 43. The provisioning system as in Claim 41, wherein the provisioning
2 trigger module comprises a processor integral to the SGSN, and wherein the
3 processor generates the provisioning notification in response to the detection of the
4 unprovisioned terminal.

1 44. The provisioning system as in Claim 41, further comprising a Network
2 Management System (NMS) to receive the provisioning notification from the SGSN
3 as an NMS alarm signal, and to transmit the provisioning notification to the
4 provisioning server in response thereto.

1 45. The provisioning system as in Claim 28, wherein the provisioning
2 server comprises:

- 3 a phone capability database to store mobile terminal models
4 corresponding to each of a plurality of available equipment identifiers;
5 a configuration messages database to store provisioning data for each
6 mobile terminal model; and
7 a processor configured to obtain the provisioning data for the
8 unprovisioned terminal by retrieving the provisioning data for the mobile terminal
9 model corresponding to the equipment identifier of the unprovisioned terminal.

1 46. A computer-readable medium having computer-executable instructions
2 for initiating provisioning procedures for terminals operable in a mobile
3 communications network, the computer-executable instructions performing steps
4 comprising:

- 5 automatically detecting an unprovisioned terminal in the mobile
6 communications network; and
7 providing a notification to a provisioning server to initiate the
8 provisioning procedures for the unprovisioned terminal in response to the automatic
9 detection of the unprovisioned terminal.

10 47. A provisioning system for automatically provisioning terminals in a
11 mobile communications network, comprising:

- 12 means for monitoring for a subscriber identifier identifying a particular
13 subscriber and an equipment identifier identifying an unprovisioned terminal;
14 means for automatically detecting the unprovisioned terminal in the
15 mobile communications network, including means for determining that the subscriber
16 and equipment identifiers do not collectively correspond to known subscriber and
17 equipment affiliations; and
18 means for providing a notification to a provisioning server to initiate a
19 provisioning procedure for the unprovisioned terminal in response to the automatic
20 detection of the unprovisioned terminal.